PATENT
Attorney Docket No. 403349

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Karl-Heinz KRAMER

Application No. Unassigned

Filed: March 25, 2005

Group Art Unit: Unassigned

Examiner: Unassigned

For: FERRITIC STEEL ALLOY

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
U.S. Patent and Trademark Office
Randolph Building
401 Dulany Street, Customer Window, Mail Stop Patent Application
Alexandria, VA 22314

Pursuant to 37 CFR 1.97 and 1.98, the references listed on the enclosed Form PTO-1449 and/or Substitute Form PTO-1449 ("Form 1449") are submitted for consideration by the Examiner in the examination of the above-identified patent application.

The full consideration of the references in their entirety by the Examiner is respectfully requested and encouraged. Also, it is respectfully requested that the references be entered into the record of the present application and that the Examiner place his or her initials in the appropriate area on the enclosed Form 1449, thereby indicating the Examiner's consideration of each of the references.

The submission of the references listed on the Form 1449 is for the purpose of providing a complete record and is not a concession that the references listed thereon are prior art to the invention claimed in the patent application. The right is expressly reserved to establish an invention date earlier than the above-identified filing date in order to remove any reference submitted herewith as prior art should it be deemed appropriate to do so.

Further, the submission of the references is not to be taken as a concession that any reference represents art that is relevant or analogous to the claimed invention. Accordingly, the right to argue that any reference is not properly within the scope of prior art relevant to an examination of the claims in the above-identified application is also expressly reserved.

The Information Disclosure Statement is being filed:

☒ **within** any one of the following time periods: (a) within three months of the filing date of a national application other than a continued prosecution application under 37 CFR 1.53(d); (b) within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 of an international application; (c) before the mailing date

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.K./

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of a first Office Action on the merits; or (d) before the mailing of a first Office Action after the filing of a request for continued examination under 37 CFR 1.114.

☐ **after** (a), (b), (c) or (d) above, but before the mailing date of a final action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an action that otherwise closes prosecution in the application, and includes *one* of:

☐ the Statement under 37 CFR 1.97(e) (see "Statement under 37 CFR 1.97(e)" below).

or

☐ the fee of $180 set forth in 37 CFR 1.17(p) (see "Fees" below).

☐ **after** the mailing date of a final action under 37 CFR 1.113 or a Notice of Allowance under 37 CFR 1.311, or an action that otherwise closes prosecution in the application, and on or before payment of the issue fee, and includes the Statement under 37 CFR 1.97(e) (see "Statement under 37 CFR 1.97(e)" below), and the fee of $180 as set forth in 37 CFR 1.17(p) (see "Fees" below).

☐ **after** the mailing date of a Notice of Allowance under 37 CFR 1.311, and on or before payment of the issue fee, and **within** thirty days of receiving each item of information contained in the Information Disclosure Statement, and includes the Statement under 37 CFR 1.704(d) (see "Statement under 37 CFR 1.704(d)" below), and the fee of $180 as set forth in 37 CFR 1.17(p) (see "Fees" below).
NOTE: This is for original applications except applications for a design patent, filed on or after May 29, 2000, wherein a paper containing only an Information Disclosure Statement in compliance with 37 CFR 1.97 and 1.98 is being filed.

Copies of the References

☒ Copies of the references listed on the enclosed Form 1449 are enclosed herewith.

☐ Copies of U.S. patents and patent applications that are listed on the accompanying Form 1449 are not enclosed herewith. Copies of other references identified on the accompanying Form 1449 are enclosed herewith.

☒ Attached to each reference not in the English language is a concise explanation of the relevance pursuant to 37 CFR 1.98(a)(3). An English-language equivalent/patent, or an English-language abstract, or an English-language version of the search report or action by a foreign patent office in a counterpart foreign application indicating the degree of relevance found by the foreign office is being submitted in lieu of a concise explanation of the relevance pursuant to 37 CFR 1.98(a)(3).

☐ A copy of the foreign search report is enclosed herewith.

☐ The references listed on the enclosed Form 1449 were previously identified in the parent application(s) of the present application, and copies of the references were furnished at that time. Accordingly, additional copies of the references are not submitted herewith, so as not to burden the file with duplicate copies of references.

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The Examiner is respectfully requested to carefully review the references in accordance with the requirements set out in the Manual of Patent Examining Procedure. In accordance with 37 CFR 1.98(d), the details of the parent application(s) relied upon for an earlier filing date under 35 USC 120 in which copies of the references were previously furnished are set out below:

U.S. APPLICATIONS		Status *(check one)*		
U.S. APPLICATIONS	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
1.				
2.				
3.				

Statement under 37 CFR 1.97(e)

☐ The **undersigned** hereby states that each item of information contained in the Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign patent application not more than three months prior to the filing of the Information Disclosure Statement.

☐ The **undersigned** hereby states that no item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign patent application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in the Information Disclosure Statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the Information Disclosure Statement.

Statement under 37 CFR 1.704(d)

☐ The **undersigned** hereby states that each item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart application and that this communication was not received by any individual designated in 37 CFR 1.56(c) more than thirty days prior to the filing of the Information Disclosure Statement.

Fees

☒ **No fee** is owed by the applicant(s).
☐ The **IDS Fee of $180** under 37 CFR 1.17(p) is enclosed herewith.

Method of Payment of Fees

☐ Attached is a check in the amount of $.
☐ Charge Deposit Account No. 12-1216 in the amount of $. (A duplicate copy of this communication is enclosed for that purpose.)

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Authorization to Charge Additional Fees

☒ If any additional fees are owed in connection with this communication, please charge Deposit Account No. 12-1216. (A duplicate copy of this communication is enclosed for that purpose.)

Instructions as to Overpayment

☒ Credit Account No. 12-1216.
☐ Refund

Respectfully submitted,

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Date: March 25, 2005
JAW/tps

IDS (Revised 1/14/05)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.K./

Please type a plus sign (+) inside this box → ⊞

Substitute for form 1449A/B/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	1	of	1

Complete if Known	
Application Number	Unassigned 10/529325
Filing Date	March 25, 2005
First Named Inventor	Karl-Heinz KRAMER
Group Art Unit	Unassigned
Examiner Name	Unassigned
Attorney Docket Number	403349

FOREIGN PATENT DOCUMENTS

Examiner Initials	Doc. No.	Foreign Patent Document: Office	Foreign Patent Document: Application or Patent Number	Foreign Patent Document: Kind Code	Name of Patentee or Applicant	Date of Publication	Translation: Yes	Translation: No*+
	A1	JP	7-244172		Seiko Instr Inc	09/19/1995		X+
	A2	JP	7-252605		Nippon Steel Corp	10/03/1995		X+
	A3	EPO	0 379 061		EBAUCHESFABRIK ETA AG (CH)	07/25/1990		X+

OTHER - NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Doc. No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number (s), publisher, city and/or country where published.	Translation: Yes	Translation: No*+
	A4	P. Haudrechy et al., "Innocuousness of stainless steels in contact with food or skin", Stainless Steels '96, Proceedings, [European Congress], 2nd Duesseldorf/Neuss, Germany, June 3-5, 1996 (1996), 228-235 Publisher: Verein Deutscher Eisenhuettenleute, Duesseldorf, Germany		
	A5	"Standard Test Methods for Determining Average Grain Size[1]", ASTM Designation:E 112-88, published October 1988, pages 227-252		
	A6	"Metallographic test methods; microscopic examination of special steels using standard diagrams to assess the content of non-metallic inclusions", DIN 50 602 Sep 1985		*
	A7	"Nichtrostende Stähle", Stahl Eisen (no year) pages 16-36, 141-147		*
	A8	"STAHLSCHLÜSSEL" 18. vollständig neu bearbeitete und erweiterte Auflage 1998 (Neuaflagen alle 3 Jahre) ISBN 3-922599-14-1, pages 326-331		*
	A9	P.R. Levey et al., "A Mechanistic Study of the Effects of Nitrogen on the Corrosion Properties of Stainless Steels", Corrosion-Vol. 51, No. 12, 1995 NACE International, pages 911-921		
	A10	Barbara Elvers et al., "ULLMANN'S ENCYCLOPEDIA of INDUSTRIAL CHEMISTRY", Fifth, Completely Revised Edition, Volume A-16: Magnetic Materials to Mutagenic Agents, page 26		
	A11	Anton L. Schaeffler, "Selection of Austenitic Electrodes for Welding Dissimilar Metals", Welding Research Supplement , October		
	A12	Anton L. Schaeffler, "Constitution Diagram for Stainless Steel Weld Metal", Metal Progress: page 680		
	A13	Manfred Schirra, Die historisch-empirische Entwicklung des Gefügediagrammes der Cr-Ni-Stähle", Sonderdruck aus, Stahl und Eisen 112 (1992), Heft 10, Seite 117-120 Nachdruck verboten. Veriag Stahleisen mbh, Düsseldorf		*
	A14	Hubert Gräfen, "Entwicklungstendenzen metallischer Werkstoffe aus der Sicht der Verwendung im Chemieanlagenbau", Chem-Ing-Tech. 54 (1982) Nr. 2,S. 108-119		*
	A15	Von Klaus Lorenz et al., "Über das Korrosionsverhalten austenitischer Chrom-Nickel-(Molybdän-) Stähle mit und ohne Stickstoffzusatz unter besonderer Berücksichtigung ihrer Beanspruchbarkeit in chloridhaltigen Lösungen", Thyssenforschung 1. Jahrg. 1969, Heft 3, pages 97-108		*
	A16	Stähle bis Textilfärberei, "Ullmanns Encyklopädie der technischen Chemie", 4., neubearbeitete und erweiterte Auflage, Band 22		*
	A17	5. Korrosionsbeständigkeit, Informationsstelle Edelstahl, pages 12, 13		*

Examiner Signature	/Christopher Kessler/	Date Considered	03/14/2008

* A concise statement of relevance is being submitted in lieu of a translation. 37 CFR 1.98(a)(3).

\+ An English-language equivalent/patent, or an English-language abstract, or an English-language version of the search report or action by a foreign patent office in a counterpart foreign application indicating the degree of relevance found by the foreign office is being submitted in lieu of a concise explanation of relevance under 37 CFR 1.98(a)(3).

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Comments on Documents Submitted in the Present IDS

a) References cited in the international search report:

The English abstracts of the citations are provided herewith, without commenting on them.

b) References cited in the instant application:

[1] The norm ASTM E 112-88 provides a measuring technique for grain sizes, but does not disclose any steel alloys.

[2] The norm DIN 50 602 (in German) is used to determine non-metallic inclusions. It does not disclose any steel alloys.

[3] The textbook "Nichtrostende Stähle" (in German) discloses on section 2.2 ("2.2 Zusammensetzung und Gefüge" on pages 16/17 the influence of individual elements on the steel structure. In section 2.2.1, "Ferritische Stähle" ("ferritic steels") the first sentence states that "in ferritic steels, due to the high content of ferrite-stabilizing alloying elements such as ...titanium or niobium, the austenitic region of iron is cut of so strongly that no conversion [*to austenite*] or only a partial conversion [*to austenite*] is observed". This hints at that a ferritic steel should be high in titanium or niobium, whereas the ferritic alloys of the instant invention are low in Ti and Nb (0.01% each).

[4] The reference "Stahlschlüssel" discloses the chemical composition of a range of steel alloys, and on the last page of this reference, typical uses of these alloys. Note that the known alloys which according to the knowledge of the inventor and applicant are closest to the claimed ones are given in table 1 of the instant application.

[5] This reference discusses the influence of nitrogen on corrosion, but does not disclose any specific alloys. It also shows in its equation 1 (page 913) that nitrogen is 30 times more potent than nickel and 60 times more potent than manganese as an austenite former, which teaches away from using nitrogen in a ferritic steel.

[6] This reference discloses on page 26 that the presence of "carbon, nitrogen, sulfur and oxygen" is "critical" for the magnetic properties of iron. The alloys of the instant invention are nevertheless soft magnetic, despite the presence of nitrogen.

[7] This reference discloses a number of steel alloys, but none with nitrogen, as asked for by the instant invention.

[8] This reference discusses the predictability of the microstructure of some specific steels by using the Schaeffler diagram (note: the diagram itself is shown on page 680B of this reference, which page we do not have at our disposition). For one exemplary steel ("type 318") it predicts the microstructure to be "between 0 and 5% ferrite", and finds actually by magnetic measurement "average of 2% ferrite".

As to the also cited thesis of A.L. Schaeffler of 1944 (University of Wisconsin) we cannot provide copies of the relevant passages. This reference is, however, the oldest reference dealing with the

Schaeffler diagram known to us, the inventor and the applicant, and would therefore likely not be more relevant than the later reference [7], also dealing with this diagram.

We cannot provide a copy of the article of Briggs and Parker (Climax Molybdenum Company, p. 6-7, 1965). The essence of this publication is summarised, however, in a review article (Schirra, "Stahl und Eisen" 112/10, p. 117-120, 1992, in German, provided herein as reference [9]), namely in table 2 ("Tafel 2" on page 3) and figure 4. Judging from reference [9], Briggs and Parker included titanium as 1.5 chromium equivalents and niobium as 1.75 chromium equivalents into the Schaeffler diagram. A higher content of the chromium equivalents titanium and niobium would give, according to the Schaeffler diagram, a higher probability of a ferritic steel. The alloys of the instant invention, however, are ferritic despite the low titanium and niobium contents of 0.01% each.

[10] This document (in German) discusses the corrosion resistance of Cr/Mo steels, but on steels where the molybdenum content is about 4 to 6 %, i.e. above the contents of the alloys of the instant application.

[11] This reference (in German) discusses the corrosion resistance of CrNi(Mo) steels, optionally with addition of nitrogen. The specifically disclosed alloys are those of tables 1-9. Of these, none falls with their nitrogen and/or chromium and/or niobium and/or molybdenum contents into the ranges of the instant invention. Most of the alloys are austenitic (see also the title of this reference), except those of table 6, where the caption states that some are "semi-ferritic or ferritic". Neither the table nor the corresponding comment in the text disclose which of the alloys of table 6 are actually ferritic, but those which are titanium or niobium containing would seem ferritic. The instant invention asks for at most 0.01% of either titanium and niobium.

[12] The Ullmann 4th edition reference (in German) describes general procedures of steel manufacture, without disclosing specific steel alloys. As there is an English version of the Ullmann 5th edition available to us (see reference [6] above) we assume that there is also an English version of the 4th edition available to the USPTO.

c) Further references:

The inventor is aware of one further publication (reference [13], in German) not cited in the application. This reference discloses the steels numbers 1.4000, 1.4006, 1.4113, 1.4510, 1.4511 and 1.4512 as "ferritic". The compositions of these steels are availabe in above reference [4]. None of these contains molybdenum and nitrogen in amounts as asked for by the instant invention.